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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MAKOTO IWASHIMA, AKIHIRO HANAMURA,
MASANORI YAMAGIWA, and YASUHIKO KITAJIMA

Appeal 2008-6272
Application 10/779,613
Technology Center 2800

Decided: January 5, 2009

Before KENNETH W. HAIRSTON, JOHN A. JEFFERY,
and ELENI MANTIS MERCADER *Administrative Patent Judges*.

MANTIS MERCADER, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants seek our review under 35 U.S.C. § 134 of the Examiner's final rejection of claims 1-20. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

INVENTION

Appellants' claimed invention is directed to a power converter adapted to convert DC power to AC power to obtain driving electric power for an AC motor (Spec. 1:4-7). Power semiconductor modules 71A to 71D, 72A to 72D, and 73A to 73D sandwich coolers 11 to 16 as shown in Figure 3A (Spec. 1:21-23). The coolers 11-16 extend radially from the center of the drive shaft 4 to the motor shaft 2a at equidistant and angular positions and perpendicular to the drive shaft 4 (Figs. 1 and 3A; and Spec. 7:14-18).

Claim 1, reproduced below, is representative of the subject matter on appeal:

1. A power converter arranged in series with a motor to form a unitary structure through which an output shaft extends, comprising:

a plurality of coolers each of which extends along a radial direction with respect to an output shaft so as to be perpendicular to the output shaft and having a cooling surface defined by a direction parallel to the output shaft and the radial direction; and

a power semiconductor module mounted on the cooling surface of at least one of the plurality of coolers to supply electric power to a motor.

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THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Jackson	US 2,942,165	Jun. 21, 1960
Ishiyama	US 5,632,351	May 27, 1997
Kim	US 2001/0054730 A1	Dec. 27, 2001
Gründl	US 2004/0164625 A1	Aug. 26, 2004 (filed Mar. 15, 2002)
Gründl ¹	DE 10112799 C1	Oct. 17, 2002

The following rejections are before us for review²:

1. The Examiner rejected claims 1-10 and 18-20 under 35 U.S.C. § 102(b) as being anticipated by Gründl.
2. The Examiner rejected claims 11 and 14-17 under 35 U.S.C. § 103(a) as being unpatentable over Ishiyama in view of Gründl.
3. The Examiner rejected claim 12 under 35 U.S.C. § 103(a) as being unpatentable over Ishiyama in view of Gründl and further in view of Kim.
4. The Examiner rejected claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Gründl in view of Jackson.

Appellants argue claims 1-10 and 18-20 as a group with claim 1 as

¹ In the rejections, the Examiner relies on Gründl's foreign patent disclosure (DE 10112799 C1). The Examiner, however, also cites Gründl's US patent publication (2004/0164625 A1 which claims foreign priority to DE 101127995) as an English-language equivalent of the cited German document. This equivalence is undisputed.

² The rejection of claims 1-8 and 18-20 was withdrawn by the Examiner due to the perfection of the priority date by the submitted certified translation on May 24, 2006 (Ans. 8).

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representative (Br. 5-6). Appellants also argue claims 11 and 14-17 as a group with claim 11 as representative (Br. 7-10).³ Appellants have presented no further arguments as to the additional references of Kim and Jackson used in rejecting claims 12 and 13, respectively, but instead rely on the arguments provided for claims 11 and 1 (Br. 10). Accordingly, claims 2-10 and 18-20 stand or fall with claim 1, and claims 12-17 stand or fall with claim 11. *See* 37 C.F.R. § 41.37 (c)(1)(vii) (2004).

ANTICIPATION
ISSUE

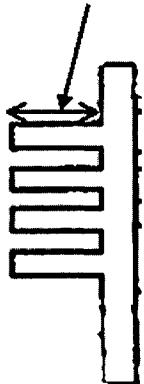
Claims 1-10 and 18-20

Appellants contend Gründl's power semiconductor module 46 is mounted on a cooling surface defined by (1) a direction parallel to the output shaft and (2) a circumferential direction, not a cooling surface defined by (1) a direction parallel to the output shaft and (2) a radial direction perpendicular to the output shaft, as described in claim 1 (emphasis in original) (Br. 5).

The Examiner responds that a portion of the cooling surface of the heat sink of Gründl is in fact defined by both the axial and radial directions as shown below (Ans. 8).

³ Only arguments made by Appellants have been considered in this decision. Arguments which Appellants could have made but did not make in the Brief have not been considered and are deemed waived. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2004).

radially extending portion of the cooling surface



Outline of the entire cooling surface

Examiner's Figure (Ans. 8) indicating a cooling surface, a portion of which extends in a radial direction.

The Examiner further explains that there is no positive recitation in the claims that the power semiconductor module must be mounted directly on the portion of the cooling surface that extends in the radial direction (Ans. 9). The Examiner further responds that claim 1 recites only a cooling surface having a radial direction which is taught by Gründl (Ans. 9). Furthermore, the Examiner states that the power semiconductor module of Gründl could be broadly interpreted as being mounted on the radially extending portion of the cooling surface because of its integral attachment therewith (Ans. 9). The Examiner further explains that the claims do not require the power semiconductor module to extend in the radial direction along with the cooling surface, only that they be mounted on a cooling surface that does (Ans. 9).

The issue before us, then, is as follows:

Have the Appellants shown that the Examiner erred by determining that

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Gründl teaches “a power semiconductor module mounted on the cooling surface” wherein “a cooling surface” is defined “by a direction parallel to the output shaft and the radial direction” as claimed?

FINDINGS OF FACT

The relevant facts include the following:

1. Gründl teaches a power semiconductor module mounted on the cooling surface (in Fig. 1 power semiconductor 46 mounted on cooler 40).
2. Gründl’s Figure 1 shows a cooling surface (i.e., cooler 40) extending along the length of the output shaft.
3. Gründl’s Figure 1 also shows a cooling surface (i.e., cooler 40) extending along the thickness of the cooler or along line 40a of Gründl’s Figure 1 or as illustrated by the Examiner’s Figure *supra* in a “radial direction.”
4. The Examiner determined that claim 1 does not require the power semiconductor module to extend in the radial direction along with the cooling surface, only that the power semiconductor module be mounted on a cooling surface which has a radial direction (Ans. 9 and claim 1).

PRINCIPLES OF LAW

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. Inc., v. Union Oil Co. of Calif.*, 814 F.2d 628, 631 (Fed. Cir. 1987).

Although claims are interpreted in light of the specification, limitations from

the specification are not read into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

ANALYSIS

Have the Appellants shown that the Examiner erred by determining that Gründl teaches “a power semiconductor module mounted on the cooling surface” wherein “a cooling surface” is defined “by a direction parallel to the output shaft and the radial direction” as claimed?

Gründl teaches a power semiconductor module 46 mounted on the cooling surface 40 (Finding of Fact 1) wherein the cooling surface (cooler 40) extends along the length of the output shaft shown in Gründl’s Figure 1 (Finding of Fact 2), and thus, in a “parallel direction to the output shaft.” Furthermore, Gründl also teaches that the cooling surface extends along a direction along the thickness of the cooler or along line 40a of Gründl’s Figure 1, and thus, in a “radial direction” as claimed (Finding of Fact 3).

Furthermore, as correctly noted by the Examiner, claim 1 does not require the power semiconductor module to extend in the radial direction along with the cooling surface, only that the power semiconductor module be mounted on a cooling surface which has a radial direction (Ans. 9). As stated *supra*, although claims are interpreted in light of the specification, limitations from the specification (i.e., that the power semiconductor module extends in the radial direction along with the cooling surface) are not read into the claims. *In re Van Geuns*, 988 F.2d at 1184.

CONCLUSION

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The Appellants have not shown that the Examiner erred by determining that Gründl teaches “a power semiconductor module mounted on the cooling surface” wherein “a cooling surface” is defined “by a direction parallel to the output shaft and the radial direction” as claimed. Thus, the Examiner’s rejection of claims 1-10 and 18-20 is sustained.

OBVIOUSNESS
ISSUE

Claims 11-17

Appellants contend that similar to Gründl, Ishiyama also fails to disclose the following recited limitations of claim 1, and thereby claims 11-17 also fail to teach these limitations as they directly or indirectly depend from claim 1 (Br. 7-10):

a plurality of coolers each of which extends along a radial direction with respect to an output shaft so as to be perpendicular to the output shaft and having a cooling surface defined by a direction parallel to the output shaft and the radial direction; and a power semiconductor module mounted on the cooling surface of at least one of the plurality of coolers to supply electric power to a motor.

The Examiner responds that the Ishiyama reference is only relied upon to teach a capacitor disposed between respective ones of a plurality of coolers and adapted to smooth a DC voltage (Ans. 9). The Examiner further states that the Gründl reference was relied upon for the teaching of a cooling surface that is defined by both a direction parallel to the output shaft and the radial direction with a semiconductor device mounted thereto (Ans. 9).

The issue before us, then, is as follows:

Have the Appellants shown that the Examiner erred by determining that the Ishiyama and Gründl combination teach “a capacitor disposed between respective ones of the plurality of coolers adapted to smooth a DC voltage” and “a power semiconductor module mounted on the cooling surface”, wherein “a cooling surface” is defined “by a direction parallel to the output shaft and the radial direction” as claimed?

FINDINGS OF FACT

The relevant facts include the following:

5. Ishiyama teaches capacitors 34 and 35 (col. 4, ll. 12-14) to smooth the input DC voltage supplied via input cables 39 and 40 (col. 4, ll. 11-13).
6. Ishiyama further teaches that these capacitors are disposed between the semiconductor devices 21, 22, and 23 (Fig. 10).
7. Ishiyama teaches that the cooling fins 47 of the heat sink 20 are disposed closely under the semiconductor modules 21, 22, and 23 (Fig. 9 and col. 4, ll. 56-60).

PRINCIPLES OF LAW

The Examiner’s articulated reasoning in the rejection must possess a rational underpinning to support the legal conclusion of obviousness. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). The Supreme Court, citing *In re Kahn*, 441 F.3d at 988, stated that “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). However, “the analysis

need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.*

“[O]ne cannot show non-obviousness by attacking references individually where . . . the rejections are based on combinations of references.” *In re Keller*, 642 F.2d 413, 426 (CCPA 1981).

In a case of this type where a rejection is predicated on two references each containing pertinent disclosure which has been pointed out to the applicant, we deem it to be of no significance, but merely a matter of exposition, that the rejection is stated to be on A in view of B instead of on B in view of A, or to term one reference primary and the other secondary. It would perhaps have saved much argument of the kind we have before us if the Patent Office had stayed with its rejection of the claims as unpatentable over A and B ‘considered together’ and had merely stated its reasons for such rejection without formal alinement of the references. Fifteen years ago this court pointed out in *In re Cowles*, 156 F.2d 551, 554, 33 CCPA 1236, that such differing forms of expression did not constitute different grounds of rejection, were of little consequence, and that basing arguments on them was ‘attempting to make a mountain out of a mole-hill.’ (Emphasis added).

In re Bush, 296 F.2d 491, 496 (CCPA 1961).

ANALYSIS

Have the Appellants shown that the Examiner erred by determining that the Ishiyama and Gründl combination teaches “a capacitor disposed between respective ones of the plurality of coolers adapted to smooth a DC voltage” and “a power semiconductor module mounted on the cooling surface”, wherein “a cooling surface” is defined “by a direction parallel to the output

shaft and the radial direction” as claimed?

Ishiyama teaches capacitors 34 and 35 to smooth the input DC voltage supplied via input cables 39 and 40 (Finding of Fact 5). Ishiyama further teaches that these capacitors are disposed between the semiconductor devices 21, 22, and 23 (Finding of Fact 6). Furthermore, Ishiyama teaches that the cooling fins 47 (i.e., coolers) of the heat sink 20 are disposed closely under the semiconductor modules 21, 22, and 23 (Finding of Fact 7). Thus, Ishiyama teaches capacitors 34 and 35 disposed between the respective ones of the plurality of coolers (i.e., cooling fins 47 which are placed under the semiconductor modules) adapted to smooth a DC voltage (i.e., smoothing capacitors) as claimed.

Furthermore, it was determined *supra* that Gründl teaches “a power semiconductor module mounted on the cooling surface” wherein “a cooling surface” is defined “by a direction parallel to the output shaft and the radial direction” (Findings of Fact 1-4).

Thus, Appellants’ argument that Ishiyama does not teach the cooling system as claimed is not persuasive, because the Examiner relied on Gründl for those teachings, and as stated *supra*, one cannot show non-obviousness by attacking references individually where the rejections are based on combinations of references. *Keller*, 642 F.2d at 425.

Furthermore, the Examiner articulated as a rationale to combine that substituting Ishiyama’s cooling system with that disclosed by Gründl’s would provide a cooling means for semiconductors that is compact, economically producible and reliable as disclosed by Gründl (¶[0013]) (Final Rej. 6). The articulated reasoning supports the legal conclusion of obviousness (i.e.,

substituting for a compact, economically producible and reliable cooling system). *KSR*, 127 S.Ct. at 1741.

The Examiner further responded that Ishiyama was only relied upon for the teaching of the smoothing capacitors (Ans. 9). Thus, it would have been just as persuasive to merely incorporate the smoothing capacitors between respective ones of the plurality of Gründl's coolers in order to smooth the input DC voltage before its conversion to AC voltage. In other words, as stated *supra*, when the pertinent disclosure from two references has been pointed out to the Appellant, we deem it to be of no significance, but merely a matter of exposition, that the rejection is stated to be on "A in view of B instead of on B in view of A, or to term one reference primary and the other secondary" (emphasis added). *Bush*, 296 F.2d at 496.

For the foregoing reasons, Appellants have not persuaded us that the Examiner erred in rejecting representative claim 11 or claims 12-17 which fall with claim 11. Accordingly, we will sustain the Examiner's rejections of those claims.

CONCLUSION

The Appellants have not shown that the Examiner erred by determining that the Ishiyama and Gründl combination teaches "a capacitor disposed between respective ones of the plurality of coolers adapted to smooth a DC voltage" and "a power semiconductor module mounted on the cooling surface", wherein "a cooling surface" is defined "by a direction parallel to the output shaft and the radial direction" as claimed.

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ORDER

The decision of the Examiner to reject claims 1-10 and 18-20 under 35 U.S.C. § 102(b), and claims 11-17 under 35 U.S.C. § 103(a) is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

gvw

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